CATALOG DOCUMENTATION
REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 1
1993-1994 FISH TISSUE CONTAMINATION IN MAINE LAKES
INORGANIC CONCENTRATIONS IN LAKE SEDIMENT DATA

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION

1.1 Title of Catalog document

Regional Environmental Monitoring and Assessment Program - Region 1
1993-94 Fish Tissue Contamination in Maine Lakes
Inorganic Concentrations in Lake Sediment Data Set

1.2 Author of the Catalog entry

Melissa Hughes, OAO Corporation

1.3 Catalog revision date

20 March 1998

1.4 Data set name

SEDANAL

1.5 Task Group

Region 1

1.6 Data set identification code

00008

1.7 Version

001

1.8 Requested Acknowledgment

If you plan to publish these data in any way, EPA requires a standard statement for work it has supported:

"Although the data described in this article have been funded wholly or in part by the U. S. Environmental Protection Agency through its Regional EMAP program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigators

Barry Mower
Jeanne DiFranco
Linda Bacon
David Courtemanch
State of Maine Department of Environmental Protection

2.2 Investigation Participant-Sample Collection

Not applicable

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The R-EMAP Region 1 Inorganic Concentrations in Lake Sediment data set presents the concentrations of inorganic compounds measured in a lake sediment sample. The compounds measured include: mercury, cadmium, lead, total organic carbon, % solids and % silt. Sediment contamination is a factor that may affect a fish's or lake's sensitivity and may be a result of airborne or other sources of pollution.

3.2 Keywords for the Data Set

Lake, Maine, sediment, mercury, lead, cadmium, total organic carbon, % solids, % silt

4. OBJECTIVES AND INTRODUCTION

4.1 Program and Project Objectives

4.1.1 Program Objective

Regional Environmental Assessment and Monitoring Program (R-EMAP) was initiated to test the applicability of the EMAP approach to answer questions about ecological conditions at regional and local scales. Using EMAP's statistical design and indicator concepts, R-EMAP conducts projects at smaller geographic scales and in shorter time frames.

4.1.2 Project Objective

The primary goal of this study was to estimate the levels of contamination in fish populations, and the risk these levels pose to human and wildlife consumers. The primary objective was to determine concentrations of cadmium, lead, mercury, PCBs and selected pesticides in fish collected from Maine lakes.

4.2 Data Set Objective

The objective of this data set is to characterize contamination of lake sediments by inorganic compounds and to measure sediment characteristics that may affect the bioavailability of these contaminants.

4.3 Data Set Background Discussion

From a population of 1800 Maine lakes that have been surveyed by the Maine (DIFW) and have principal fisheries, one hundred and fifty lakes were selected using the EMAP sampling design and 125 were sampled. Correlations with factors that may affect a fish's or lake's sensitivity to contamination were examined secondarily. These factors include species, size, age, geography, geology, water and sediment chemistry, hydrology, trophic state and air flow patterns. The results will be used to develop preventive actions and management techniques.

4.4 Summary of Data Set Parameters

Inorganic compound concentrations and sediment characteristics were measured in a sediment sample.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

Collect an uncontaminated sediment sample for organic and characterization analyses.

5.1.2 Sample Collection Methods Summary

DIFW bathymetric maps were used to determine the deepest part of each lake. An Ekman dredge was used to collect enough sediment to equally fill three Nalgene sample bottles. Only the top two centimeters of sediment was transferred. After collection, samples were placed in a cooler on ice.

5.1.3 Sampling Start Date

June 1993
September 1994

5.1.4 Sampling End Date

September 1993
September 1994

5.1.5 Platform

Not applicable.

5.1.6 Sampling Equipment

Ekman dredge

5.1.7 Manufacturer of Sampling Equipment

Not known

5.1.8 Key Variables

The data are based on the results of chemical analyses.

5.1.9 Sampling Method Calibration

Not applicable.

5.1.10 Sample Collection Quality Control

Acid-washed plastic spoons were used to transfer sediment. Care was taken to avoid sediment in contact with the sides of the dredge.

5.1.11 Sample Collection Method Reference

Maine Department of Environmental Protection et. al., 1993. Project Work/ Quality Assurance Plan, Fish Tissue Contamination in the State of Maine. December 20, 1993.

5.2 Data Preparation and Sample Processing

Samples were frozen upon receipt at the laboratory. Before analyses, sediment samples were dried and homogenized. See the Project Work/QA Plan (Maine DEP et al, 1993) for a detailed analytical methods.

6. DATA MANIPULATIONS

Not applicable

6.1 Name of new or modified values

Not applicable

6.2 Data Manipulation Description

Not applicable

6.3 Data Manipulation Examples

Not applicable.

7. DATA DESCRIPTION

7.1 Description of Parameters

CONTENTS

Data Set Name: SEDANAL Observations: 136
Engine: V612 Variables: 12

#	Parameter SAS Name	Data Type	Len	Parameter Format	Label
1	REP	Char	6	$6.	F=field replicate, L=lab replicate
2	MIDAS	Char	11	$11.	Lake identification number
3	LAKE	Char	10	$10.	Lake name
4	TOC_PPMC	Num	8	16.2	Total organic carbon (ppm C; EPA Lab)
5	PCTSLDEP	Num	8	11.3	% solids (EPA Lab)
6	PCTSLDHE	Num	8	12.1	% solids (HEtL Lab)
7	PCT_SILT	Num	8	8.1	% silt (HEtL Lab)
8	HG_PPM	Num	8	9.3	Mercury (ppm)
9	HG_F	Char	7	$7.	Mercury flag:ND=not detected at level indicated in results
10	CD_PPM	Num	8	11.4	Cadmium (ppm)
11	CD_F	Char	7	$7.	Cadmium flag:ND=not detected at level indicated in results
12	PB_PPM	Num	8	13.5	Lead (ppm)

7.1.6 Precision to which values are reported

Data were reported to the number of decimal places noted in 7.1

7.1.7 Minimum values in data set

Variable	Minimum
TOC_PPMC	24481.32
PCTSLDEP	4.451
PCTSLDHE	4.9
PCT_SILT	0.7
HG_PPM	0.002
CD_PPM	0.0001
PB_PPM	0.00056

7.1.8 Maximum values in data set

Variable	Maximum
TOC_PPMC	820633.54
PCTSLDEP	70.135
PCTSLDHE	58.0
PCT_SILT	72.6
HG_PPM	0.420
CD_PPM	5.2000
PB_PPM	390.00000

7.2 Data Record Example

7.2.1 Column Names for Example Records

```
REP;MIDAS;LAKE;TOC_PPMC;PCTSLDEP;PCTSLDHE;PCT_SILT;HG_PPM;HG_F;CD_PPM;CD_F;PB_ PPM;
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7.2.2 Example Data Records

```
REP;MIDAS;LAKE;TOC_PPMC;PCTSLDEP;PCTSLDHE;PCT_SILT;HG_PPM;HG_F;CD_PPM;CD_F;PB_ PPM;
 ;0041;CARL;458715.14;11.595;7.8;7.9;0.160; ;1.2000; ;46.00000;
 ;0078;EMBD;86313.78;27.817;21.0;53.3;0.210; ;2.5000; ;180.00000;
 ;0159;PLEA;102822.85;24.051;22.5;25.9;0.110; ;0.9300; ;51.00000;
 ;0177;MEDD;103480.18;99.999;22.7;29.6;0.180; ;1.1000; ;68.00000;
 ;0202;ROWE;102199.36;25.127;20.6;34.4;0.140; ;1.0000; ;59.00000;
```

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-71 Degrees 00 Minutes 47 Decimal Seconds

8.2 Maximum Longitude

-67 Degrees 10 Minutes 30 Decimal Seconds

8.3 Minimum Latitude

43 Degrees 15 Minutes 21 Decimal Seconds

8.4 Maximum Latitude

47 Degrees 07 Minutes 11 Decimal Seconds

8.5 Name of area or region

EPA Region 1

The sampling area included the entire state of Maine.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Data Quality Objectives

The data quality objective for sediment duplicates was a relative percent difference of less than 50%. These goals applied only if both duplicate values were greater than two times the reporting limit.

9.2 Data Quality Assurance Procedures

Collection of one set of field duplicate samples for each region ensured that duplicates were collected from a minimum of 5% of the project lakes for all parameters sampled, as required in the Project Work/QA Plan. Duplicate sediment samples were collected for mercury, cadmium, lead, total organic carbon, grain size and percent moisture.

A sample duplicate is a second sample obtained following the same procedures as for the first sample. It provides information on the homogeneity of the matrix and the consistency with which samples are collected, preserved and analyzed.

Duplicates were assigned unique identification numbers for use in laboratory analyses. Pre-labeled containers were identified as additional samples, not as duplicates, to reduce analytical bias. The duplicate results were not averaged with the sample, but were maintained in the data base as quality control indicators.

Equipment blanks samples were collected for inorganic compounds and were noted as such in field records. After routine decontamination of equipment upon completion of sampling a lake, each team submitted one equipment blank for the Ekman dredge.

9.3 Quality Assessment Results

Samples which fell outside the 50% relative percent difference include one each for mercury, cadmium, lead and percent silt, two for percent solids and three for total organic carbon. Duplicate and split analyses results can be found in DiFranco et al, 1995.

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site or contact personnel listed in Section 10.3.

10.2 Data Access Restrictions

Not Applicable

10.3 Data Access Contact Persons

Linda C. Bacon
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10.4 Data Set Format

Data files are in ASCII semi-colon delimited format.

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW site.

10.7 EMAP CD-ROM Containing the Data Set

Data are not available on CD-ROM

11. REFERENCES

DiFranco et. al., 1995. Fish Tissue Contamination in Maine Lakes. Data Report. State of Maine Department of Environmental Protection, Bureau of Land and Water Quality, Division of Environmental Assessment. September 1995.

Maine Department of Environmental Protection et. al., 1993. Project Work/ Quality Assurance Plan, Fish Tissue Contamination in the State of Maine. Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife and U.S. EPA Region 1 Environmental Services Division. December 20, 1993.

12. TABLE OF ACRONYMS

ACRONYM	DESCRIPTION
DEP	Maine Department of Environmental Protection
DIFW	Maine Department of Inland Fisheries and Wildlife
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
HetL	Maine Department of Human Services Health and Environmental Testing Laboratory
MIDAS	Maine Information Display Analysis System - unique number assigned to each Maine lake
PCBs	polychlorinated biphenyls

12. TABLE OF ACRONYMS, continued

QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
REMAP	Regional Environmental Monitoring and Assessment Program
UMO	National Biological Survey and Sawyer Environmental Chemistry Laboratories at the University of Maine at Orono

13. PERSONNEL INFORMATION

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